

## ANNUAL REPORT RESEARCH SCHOOL OF BIOLOGICAL SCIENCES 1994

Presentation to Council 7 April, 1995

Thank you, Chancellor, for this opportunity to report on research and other activities in the Research School of Biological Sciences. It is fair to say that in 1994 we spent a good deal of time researching our research achievements of the past five years in preparation for the review that took place February 13-17 last. The School's response to the review report, which was excellent - a ringing endorsement of our research and the ways we have devised to stay in the forefront - will be presented to BIAS next Thursday and will come to you in due course.

Preparation for the review told us a good deal about ourselves, and I'll relate a little of this today. Indeed, one of my major publications for the last year was the body of the School submission which comprises p.11 - 49 of the Annual Report. This is the most closely researched and deeply considered account of the Research School of Biological Sciences ever published. The Annual Report this year records more data on RSBS than you are ever likely to need to know. Among other things, however, you may wish to notice on p. 29 that a third of our research students are female and on p. 34 that a third of our non-tenured staff and 10% of our tenured staff are female.

What did a collection of eleven research groups discover about itself in preparation for the review? First, we discovered a network of interactions about four major research themes that we had previously taken for granted. The linkages are shown in Figure 1, p.18 of the Annual Report. These themes gave us the coherence needed to distil our entire research for presentation to the review and for more coherent relationships in the Institute. The substance of these linkages is presented in p.50-105 of the Annual Report, as abstracts of some 100 research projects. This integrated presentation of the School was very well received by the reviewers, and by some forty individuals and groups who made submissions or provided assessments.

Second, we found ourselves in a leadership role for two major cross-campus interdisciplinary initiatives (in biomolecular structure and function, and in global and climatic change). I believe that these will feature high on the Institute's list of needs and opportunities as it goes into the last phases of review. The relationships underpinning the proposed National Centre for Biomolecular Structure and Function are shown in Figure 2, p.20. Built on five years of experience and the success of the original Centre of Molecular Structure and Function, I expect you will hear more of this proposal in the near future.

As you can imagine, this major distraction did slow research output in 1994, but nevertheless, it was a year of significant achievements. The School continues to shape the way biology is done. The second edition of Watson and Dallwitz "The Grass Genera of the World" was published. This book and CD-Rom has set the standards for modern classifications based on unique information technology which is being used from Brazil to the Baltic, for studies of viruses to biodiversity. Dr. Badger in the Molecular Plant Physiology Group, published his second invited Annual Review chapter in a decade, a distinction only achieved by 3 or 4 other Australians (2 from RSBS), and very few people internationally, over the last thirty years. Researchers in three groups contributed articles to the frontline "Trends in..." series. Bibliometric data prepared for the review, which remain confidential in detail, established the School well ahead of its comparators in all sub-fields, so far as citation impact is concerned.

My own research group, now three years old, is beginning to make its mark and I will also relate a little of this today. It is essential, in my view, that directors be enabled to retain a high research profile relevant to their schools. Leadership in the front-line is a feature of the Institute. The Director's Research Group seeks to lead by example, and is doing research of high international impact, involving collaboration at several levels. It is now a team of seven non-tenured staff, two supported by ARC and one by the CRC in plant science, and one technician supported by the rent paid by the CRC's industrial partner Groupe Limagrain. It had four research students in 1994, three of them jointly supervised in other universities, the Faculties and other groups in RSBS. It hosted several distinguished visiting fellows from Australia and overseas and organised a Robertson Symposium last May for over 100 participants from Australia and overseas.

Among 30-odd publications, the Group is particularly proud of two landmark papers in press at the end of 1994. One is a concerted attack by eight authors from RSBS, CSIRO and the University of Queensland, on the processes of photoinhibition. At a trivial level this is what happens to a shaded house plant given a breath of fresh air on a bright day. In the real world, photoinhibition is also important to the gap dynamics that renew rain forests and, as our cover photo shows, is important to the re-establishment of tree seedlings in pastures. This collaborative paper, which appeared last week, provides the evidence called for in my review of the field, (published last year), that sought to link photoprotection and photodamage. It explains better than before, what happens when plants get more light than they can use efficiently, which in Australia is most of the time. These and other aspects of photoinhibition are also presented in the latest issue of *Biologic*, distributed to science teachers before Christmas. Our other high impact paper, in *Proceedings of the US National Academy of Sciences*, is the work of the group's senior non-tenured staff member, Dr. Wydrzynski, an ARC postdoctoral fellow, Dr. Messinger, and Dr. Badger from another research group. It deals with the "Holy Grail" of photosynthesis, the reactions that enable plants to use sunlight, split water and produce oxygen. In a clever set of experiments with computer controlled flash lamps, injection of heavy water, and an old mass spectrometer, these authors really set things buzzing at the last Gordon Conference, the international forum for these matters. The background to these studies is also given in *Biologic*.

These examples of research in my own group illustrate the naturally interactive programs that ebb and flow within the School and with other research institutions in Australia. They always have, but they are not necessarily helped by externally imposed arbitrary targets for collaboration. In the review of RSBS I emphasised that the twin privileges of intellectual and fiscal autonomy as practiced in the IAS give us a real advantage to independently craft, and stay ahead of, some of the most significant developments in biology. Our review committee endorsed this most emphatically, as did the Director of Meteorology in Australia what was the most succinct submission to the review, as follows:

"I am...acutely aware of the excellence of the IAS in general and of the research record of the RSBS in particular and I am firmly of the view that this is, in large measure, a direct result of the foundation on which the IAS was built - its guaranteed ongoing funding and its autonomy in the design and conduct of its research program.

"I write because I am concerned that the currently fashionable approach to research planning, funding and management, which I believe is already doing irreparable damage to other formerly first-rate research institutions, could, if not vigorously

opposed, be extended to the IAS and the RSBS. I believe this would be counter to the best long-term interests of Australia in the broadest sense. I believe the RSBS should be regarded as an invaluable national asset. It should be carefully protected and nurtured and enabled to maintain and strengthen its performance through forceful endorsement of a policy of protecting the ingredients of its past success."

I foresee that Council is going to have to identify closely with such advice from a plethora of sources as the reviews come in. It will have the responsibility to absorb and amplify advice from 70 or so of the world's most eminent academics, from all fields researched by the Institute. This advice will determine, first the future of the IAS and second and without doubt, has the potential to influence the economic and intellectual independence of Australia in the next century. In reality the IAS review is the test of the will of this nation to entrust its knowledge-based future to those with proven records of discovery and achievement. My colleagues and I are giving you the ammunition for the battles in the war ahead. We look to you to use it to good effect.

C.B. Osmond  
Director

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